

REMARKS

The following remarks are responsive to the Advisory Action dated November 22, 2011.

In the Advisory Action, the Examiner indicated that Applicant's Amendment filed on November 15, 2011 was considered but did not place the application in condition for allowance. In particular, the Examiner maintained that Claims 1, 2, and 4-7 would be rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious of the Murata reference (U.S. Patent No. 6,017,213).

In Applicant's Amendment dated November 15, 2011, Applicant amended the claims to emphasize that the low-temperature gas reaches the centermost portion of the high temperature combustion gas for mixed cooling. Applicant argued that the Murata reference does not disclose a low-temperature gas that reaches the centermost portion of a high-temperature gas. Rather, Murata was understood to disclose a system wherein the cooling air only reaches a peripheral portion of the high temperature gas. Applicant further asserted that the size of the inlet apertures for the cooling airs were too small (i.e., 8-10 mm) to direct cooling air to the centermost portion of the high-temperature gas.

In the Advisory Action, the Examiner took the position that the "centermost portion" is interpreted to include the central axis and the space surrounding the central axis and that Figure 6 of the Murata reference designates the cooling air as reaching the "centermost portion" of the high temperature gas. The Examiner also indicated that the cooling air inherently reaches the centermost portion during the desired mixing of the gases. In particular, the Examiner contends that the structure of the Murata reference is designed to mix the two gases and therefore, one of ordinary skill in the art would inherently supply the cooling gas with sufficient pressure to ensure that the cooling gas reaches the centermost portion to provide the desired mixing. In the alternative, the Examiner argues that it would have been obvious to one of ordinary skill in the art to provide the cooling gas with sufficient pressure to ensure that the cooling gas reaches the centermost portion to provide the mixing.

However, Applicant respectfully maintains that the Murata reference does not disclose or render obvious all of the limitations of independent Claim 1 for the reasons previously advanced, as well as the reasons set forth below.

As understood, in the embodiments described in the Murata reference and shown in Figures 3, 6, 8, 9, and 10, the cooling airs CA define a fluid flow having two directional components: 1) a first component directed toward a head of a probe; and 2) a second component directed toward the centermost portion of the high temperature gas. Furthermore, the cooling airs CA flowing in the first directional component, i.e., toward the head of the probe, have a tendency to flow into a cement kiln when the speed of the cooling airs CA is high, which is problematic because of power/heat efficiency reduction.

Conversely, in the claimed invention, the low-temperature gas has no velocity vector component in a direction opposite to the flow of the high-temperature gas. Thus, the low-temperature gas does not flow toward the head of a probe and into the cement kiln, even when the speed of the low-temperature gas is high. As a result, the claimed invention solves the problem of power/heat efficiency reduction experienced as a result of the configuration disclosed in the Murata reference.

Another distinction between the claimed invention and the teachings of the Murata reference is that during usage of the Murata probe, the diameter of the probe becomes large. Given that the kiln exhaust gas flow passage is narrow and that various devices for waste treatment are installed at a kiln entrance hood, it becomes difficult to install a large-scale probe at the entrance hood.

On the other hand, in the claimed invention, the low-temperature gas has no velocity vector component in a direction opposite to the flow of high-temperature gas, which allows the low-temperature gas to travel at high-speed. Furthermore, in the claimed invention, the velocity of the low-temperature gas between the inner and outer tubes may be raised to a permissible limit of the pressure loss accompanying the increase in the flow velocities, which holds the outer diameter of the problem small, as described in paragraph [0013] of the specification, reproduced below.

[0013] With the present invention, since the low-temperature gas flows in the direction that is substantially perpendicular to the sucking direction of the high-temperature combustion gas and is toward the center of the flow of the high-temperature combustion gas, the low-temperature gas with a certain momentum reaches to the central portion of the flow of the high-temperature combustion

gas, and is efficiently mixed with the high-temperature combustion gas, which allows the high-temperature combustion gas to be cooled efficiently and rapidly while uniformly maintaining temperature distribution in a perpendicular section to the direction of the flow of the combustion gas. Further, the conventional probe shown in the second patent document had a possibility the low-temperature gas flew into the kiln side from the head of the probe when the speed of the gas was high. However, in this invention, the low-temperature gas has no velocity vector ingredient in a direction opposite to the flow of the combustion gas, which allows the low-temperature gas to be made high-speed. With this, the velocity of the low-temperature gas between the inner and outer tubes to be raised to a permissible limit of the pressure loss accompanying the increase in the flow velocities, which holds the outer diameter of the probe small.

Thus, in view of the fact that the low-temperature gas has no velocity vector component in a direction opposite to the flow of high-temperature gas, it is easy to install the claimed probe at the kiln entrance hood.

Therefore, Applicant maintains that the claimed invention is not anticipated or rendered obvious by the Murata reference and that Claims 1-2 and 4-7 are allowable.

Conclusion

On the basis of the foregoing, Applicant respectfully submits that the stated grounds of rejection have been overcome, and that the Claims are now in condition for allowance. An early Notice of Allowance is therefore respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact Applicant's counsel at the telephone number listed below.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

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